

WHAT IS CLAIMED IS:

1. A drive circuit for a semiconductor device for driving an insulated gate transistor, said drive circuit comprising:

5 a driver for applying a gate voltage to said transistor; and

a timing controller for controlling timing of said driver,

wherein said driver is capable of applying as said gate voltage a first gate voltage and a second gate voltage to said transistor, said first gate voltage being lower than a threshold voltage of said transistor, said second gate voltage being a specified
10 voltage for driving said transistor, and

wherein said timing controller so controls said driver that application of said first gate voltage precedes application of said second gate voltage.

2. The drive circuit according to claim 1,

15 wherein said driver is capable of further applying as said gate voltage a third gate voltage to said transistor, said third gate voltage being higher than said first gate voltage and lower than said second gate voltage, and

wherein said timing controller so controls said driver that application of said third gate voltage follows application of said first gate voltage, and application of said
20 second gate voltage follows a recovery current of a main current of said transistor within a mirror effect time of said transistor.

3. The driver circuit according to claim 2, further comprising:

a voltage supply unit for generating said third gate voltage on the basis of said
25 main current, and supplying said third gate voltage to said driver.

4. The drive circuit according to claim 3,

wherein said voltage supply unit generates said gate voltage on the basis of a predetermined function which involves said main current as a variable.

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5. The drive circuit according to claim 3,

wherein said voltage supply unit generates said gate voltage on the basis of said main current flowing in a period excluding turn-on and turn-off of said transistor.

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6. The drive circuit according to claim 3,

wherein said voltage supply unit holds the maximum value of said main current in a drive period of said transistor, to generate said gate voltage on the basis of said maximum value to be applied in a subsequent drive period of said transistor.

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7. The drive circuit according to claim 3,

wherein said voltage supply unit calculates the average of said main current obtained from a plurality of drive periods of said transistor, to generate said gate voltage on the basis of said average to be applied in a subsequent drive period of said transistor.

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8. The drive circuit according to claim 3,

wherein said voltage supply unit generates said gate voltage which increases as said main current increases.

9. The drive circuit according to claim 3,

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wherein said voltage supply unit controls said gate voltage to allow slowdown

in switching speed of said transistor when said main current is lower than a predetermined level.

10. A drive circuit for a semiconductor device for driving an insulated gate transistor, said drive circuit comprising:

a voltage supply unit for generating a gate voltage to be applied to said transistor on the basis of a main current of said transistor;

a driver for applying said gate voltage generated by said voltage supply unit to said transistor; and

a timing controller for controlling timing of application of said gate voltage by said driver.

11. The drive circuit according to claim 10,

wherein said voltage supply unit generates said gate voltage on the basis of a predetermined function which involves said main current as a variable.

12. The drive circuit according to claim 10,

wherein said voltage supply unit generates said gate voltage on the basis of said main current flowing in a period excluding turn-on and turn-off of said transistor.

13. The drive circuit according to claim 10,

wherein said voltage supply unit holds the maximum value of said main current in a drive period of said transistor, to generate said gate voltage on the basis of said maximum value to be applied in a subsequent drive period of said transistor.

14. The drive circuit according to claim 10,

wherein said voltage supply unit calculates the average of said main current obtained from a plurality of drive periods of said transistor, to generate said gate voltage on the basis of said average to be applied in a subsequent drive period of said transistor.

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15. The drive circuit according to claim 10,

wherein said voltage supply unit generates said gate voltage which increases as said main current increases.

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16. The drive circuit according to claim 10,

wherein said voltage supply unit controls said gate voltage to allow slowdown in switching speed of said transistor when said main current is lower than a certain level.